The Examiner contends in the Office Action that Stark teaches "a vacuum port (not shown; column 3, lines 20-30) in said first electrode (42; Figure 4; column 3, lines 40-45) for evacuating said processing region (inside volume 25)". Stark discloses that the "lower electrode 42 can comprise suitable passageways, known per se in the art, for controlling the temperature thereof". Applicants cannot locate a reference numeral 25 for a volume that the Examiner identifies in *Stark*. Nevertheless, *Stark* fails to disclose that these passageways in any way communicate with the processing region in *Stark* that is generally between the electrodes 42, 43 or that these passageways are used to evacuate the processing region.

When the *Graham* factual inquiries are considered, unresolved differences remain between independent claim 1 and the combination of *Stark* with *Okamura* that are sufficient to preclude a *prima facie* case of obviousness. For at least this reason alone, Applicant respectfully requests that the Examiner withdraw the rejection of independent claim 1.

Furthermore, in determining the differences between the prior art and the claims, the question under 35 U.S.C. § 103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious. In this instance, Applicants submit that claim 1 would not have been considered obvious when considered as a whole.

The Examiner further contends on page 5 that the motivation for this modification to *Okamura* based upon *Stark* is "for generating lower pressure prococesses (sic)". To the contrary, a person having ordinary skill in the art would appreciate that any fluid used to regulate the temperature of the lower electrode (42) is not exhausted into the processing region. The processing space has a very controlled environment of pressure and process gas for conducting the process that is transpiring between the electrodes (42, 43) in Stark. For example, *Stark* discloses the process gas is a mixture of xenon or krypton gas, oxygen, and CF_3Br introduced with specific flow rates and a specific chamber pressure. *See* col. 3, line 63 – col. 4, line 50. Hence, the passageways in the lower electrode (42) would not communicate with the processing region. Moreover, even if an attempt were made to modify the passageways in the lower electrode (42) in Stark for use as vacuum ports (which Applicants dispute is even possible), the wafer (44) and ring (46) cover the surface of the lower electrode (42) such that any such passageways would be closed by the wafer (44) and ring (46). The modified passageways would be incapable of functioning as vacuum ports because they would be blocked by the wafer (44)

and ring (46). Consequently, the proposed modification to *Okamura* is not objectively supported by the disclosure in *Stark* or by the knowledge of a person having ordinary skill in the art.

When claim 1 is considered as a whole, the Examiner's objective reasoning to modify *Okamura* based upon *Stark* is improper and is insufficient to support a *prima facie* case of obviousness. For at least this reason alone, Applicant respectfully requests that the Examiner withdraw the rejection of independent claim 1.

Claim 1 is patentable for additional reasons.

The Examiner contends that "it would have been obvious to one of ordinary skill in the art at the time the invention was made for Okamura to establish 'an atmospheric pressure space' between 25/10a interface based on the process for making Okamura's apparatus". *Okamura* discloses that "[t]he first embodiment is characterized in that the main members of the reaction chamber 10, namely, upper bottom 10a, lower bottom 10b, sidewall 10c, sample stage 11 (except for the substrate holding portion 11a) and periphery of the upper electrode 13, are covered with synthetic quartz protective members 25". *See* col. 5, line 64- col. 6, line 2. Specifically, *Okamura* fails to disclose how the protective members 25 "cover" the main members of the reaction chamber 10. Hence, the Examiner must be contending that this is inherent in *Okamura*.

The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. The Examiner must provide a basis in fact and/or technical reasoning to reasonably support his determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art. Here, the Examiner fails to provide such a basis in fact and merely supplies a conclusion.

Because Okamura is silent as to the issue, it is more probable that there is no gap between the "25/10a "interface" in Okamura. The term "covered" does not implied that the assembly incorporates gaps between the protective members (25) and the main members of reaction chamber (10) that could be at atmospheric pressure. Moreover, even if gaps were present (which Applicants refute), the vacuum envelope of the reaction chamber is defined by the space inside the main members of the reaction chamber (10). The protective members (25) are disposed in the space inside the main members of the reaction chamber (10). Hence, even if gaps were present, these gaps would be at the same vacuum as the space inside the reaction chamber (10); not at atmospheric pressure. Hence, the reasoning in the Office Action is not objective that leads the Examiner to conclude that an atmospheric pressure space could be established between

the "25/10a interface" based on the process for making Okamura's apparatus.

When the *Graham* factual inquiries are considered, unresolved differences remain between independent claim 1 and the combination of *Stark* with *Okamura* that are sufficient to preclude a *prima facie* case of obviousness. *Okamura* fails to expressly or inherently disclose "an atmospheric pressure space between said shell and said first electrode, said second electrode, and said separating member". For at least this reason alone, Applicant respectfully requests that the Examiner withdraw the rejection of independent claim 1.

The Examiner states that "[m]otivation for Okamura to establish 'an atmospheric pressure space' between 25/10a interface based on the process for making Okamura's apparatus is for reducing product-by-process manufacturing costs". This statement amounts to mere speculation and is not supported any objective evidence. Rejections on obviousness cannot be sustained with mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness. In re Kahn, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006). The Examiner has failed to establish a rationale link between the modification proposed to *Okamura* and the alleged reduction of "product-by-process manufacturing costs". When claim 1 is considered as a whole, the Examiner's objective reasoning to modify to *Okamura* based upon *Stark* is improper and is sufficient to support a *prima facie* case of obviousness. For at least this reason alone, Applicant respectfully requests that the Examiner withdraw the rejection of independent claim 1.

Because claims 5, 6, and 18 depend from independent claim 1, Applicants submit that *Okamura* fails to anticipate these claims for at least the same reasons as claim 1. Furthermore, these dependent claims recite unique combinations of elements not disclosed or suggested by *Okamura* and *Stark*

Claims 2 and 3 over Okamura in view of Stark and Shan

Claims 2 and 3 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Okamura* and *Stark* further in view of U.S. Patent No. 5,891,350 to Shan et al. (hereinafter *Shan*). *Shan* fails to cure the deficiencies of *Okamura* and *Stark.* Hence, each of these dependent claims is patentable for at least the same reasons as independent claim 1. Furthermore, each of these dependent claims recites a unique combination of elements not disclosed or suggested by *Okamura, Stark,* and *Shan*.

Claims 15-17 over Okamura in view of Stark, Suntola, and Maher

Claims 15-17 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Okamura* and *Stark* further in view of U.S. Patent No. 5,711,811 to Suntola et al. (hereinafter *Suntola*) and U.S. Patent No. 4,381,965 to Maher, Jr., et al. (hereinafter *Maher*). Claim 15 is the sole independent claim subject to this ground of rejection. Applicants traverse the rejection.

Independent claim 15 recites "a vacuum port in said first electrode for evacuating said first and second processing regions to a sub-atmospheric pressure suitable for generating the plasma from the process gas in said first processing region and said second processing region", "an electrically conductive shell surrounding said first electrode, said second electrode, said third electrode, said first separating member, and said second separating member", and "an atmospheric pressure space between said shell and said first electrode, said second electrode, said third electrode, said first separating member, and said second separating member".

With regard to similar recitations in claim 1, the deficiencies of *Okamura* and *Stark* are discussed above in conjunction with the traversal of the rejection of claim 1. *Suntola* and *Maher*, whether considered individually or collectively, fail to remedy these deficiencies of *Okamura* and *Stark*. Accordingly, the Examiner has failed to establish a *prima facie* case of obviousness because these deficiencies in comparison with claim 15 evidence a failure to resolve the *Graham* factual inquiries. For this reason, Applicants request that the Examiner withdraw the rejection.

Because claims 16 and 17 depend from independent claim 15, Applicants submit that these claims are also patentable for at least the same reasons discussed above. Furthermore, these dependent claims recite unique combinations of elements not disclosed or suggested by *Okamura, Stark*, *Suntola*, and *Maher*.

Claims 4, 7, and 11-14 over Okamura in view of Stark, Shan, and Hirooka

Claims 4, 7, and 11-14 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Okamura* in view of *Stark* and *Shan* and further in view of U.S. Patent No. 6,700,089 to Hirooka (hereinafter *Hirooka*). *Hirooka* fails to remedy the deficiencies of *Okamura*, *Stark* and *Shan*. Hence, Applicants submit that these dependent claims are patentable for at least the same reasons as independent claims 1 and 15. Furthermore, dependent claims 4, 7, and 11-14 recite unique combinations of elements not disclosed or suggested by *Okamura, Stark*, *Shan,* and *Hirooka*.

Response to Examiner's "Response to Arguments"

On page 15 of the Office Action, the Examiner states that "the Examiner cannot find any references in the claims for the argued language". Applicants are characterizing the disclosure in Stark, not in the claims. This is the structure that the Applicants must conjecture from the Examiner's statement of the rejection are identified with the claimed vacuum port "in said first electrode". As best understood by the Applicants, the Examiner identifies structure missing in Okamura on page 3 of the Office Action and attempts to remedy this deficiency on page 4 of the Office Action with a reference to a "vacuum port (not shown; column 3, lines 20-30) in said first electrode (42; Figure 4; column 3; lines 40-45)" in Stark. After reviewing the sections of Stark cited by the Examiner, Applicants commented in their July 2, 2009 Response that "Stark discloses that the "lower electrode 42 can comprise suitable passageways, known per se in the art, for controlling the temperature thereof" and that "*Stark* fails to disclose that these passageways in any way communicate with the processing region in *Stark* that is generally between the electrodes 42, 43 or that these passageways are used to evacuate the processing region." The Examiners statement on page 15 of the Office Action ignores the context of the Applicants' remarks.

The Examiner states on page 16 of the Office Action that "the Examiner's grounds of rejection clearly state that it would have .... for Okamura to replace Okumura's first electrode .... with Stark's first electrode.... having a vacuum port ..." The problem with the Examiner's "clear" statement is that Stark fails to disclose a vacuum port in "Stark's first electrode". Applicants request that the Examiner provide a line of reasoning explaining how the passageways disclosed in the lower electrode (42) of Stark correspond to the claimed "vacuum port" that can be used to evacuate the processing region in Stark. Not only would the passageways in Stark be covered by the wafer (44) but, even if uncovered, a person having ordinary skill in the art would appreciate that the processing chamber in Stark would not be evacuated through the passageways in the lower electrode (42). The passageways in the lower electrode (42) are used to control the temperature of the wafer (44) by supplying gas into the space between the wafer (44) and lower electrode (42). The presence of the gas enhances heat transfer between the wafer (44) and lower electrode (42) in comparison with permitting the space

between the wafer (44) and lower electrode (42) to be evacuated when the processing region is evacuated.

On page 17 of the Office Action, the Examiner takes umbrage with the Applicants' arguments regarding the Examiner's proposed modification to Okamura.

The Examiner states that "the Examiner has not made any reference to any of the suggested alterations or results Applicant has proposed above". This is incorrect. The Examiner alleges in the Office Action that a vacuum port (22) is disclosed in Okamura. However, the Examiner recognizes in the Office Action that the vacuum port (22) is not located in either of the electrodes (11, 13) identified by the Examiner in Okamura. The Examiner proposes in the Office Action to replace the vacuum port (22) of Okamura with the vacuum port that the Examiner alleges is present in the lower electrode (42) of Stark. This is the very modification that the Applicants are rebutting with objective reasons demonstrating why the Examiner's attempted modification to Okamura is inappropriate.

The Examiner sets forth a belief that the "proposed combination would necessarily function in the manner that both Okamura and Stark teach as disclosed". This is incorrect.

Specifically, if an attempt were made to use the passageways in the lower electrode (42) in Stark as vacuum ports (which Applicants dispute is even possible), the wafer (44) and ring (46) occlude these passageways in the lower electrode (42) so that they would be incapable of functioning as vacuum ports to evacuate the processing space. The Examiner's proposed modification to Okamura based upon the teachings in Stark would eliminate the vacuum port in Okamura. This is the epitome of a loss of functionality in Okamura if Okamura were modified based upon Stark as proposed by the Examiner. The Examiner's proposed modification would render Okamura unsatisfactory for its intended purpose, which is not permitted under MPEP § 2143.01, in that the vacuum port would be eliminated.

The Examiner's stated rationale on page 5 of the Office Action for modifying Okamura based upon Stark is "for generating lower pressure prococesses *(sic)*". To reiterate, this rationale is not reasonable because the ability to generate lower pressure "prococesses" would be lost if the Examiner's proposed modification to Okamura based upon Stark were made. As explained above, the wafer (44) and ring (46) occlude the passageways that the Examiner alleges serve as a vacuum port in the lower electrode (42) of Stark.

On pages 17-19 of the Office Action, the Examiner treats the Applicants' position that an atmospheric pressure space is absent between the shell (10a, 10b) identified by the Examiner in Okamura and the electrodes (11, 13) and separating member (25) identified by the Examiner in Okamura. To support his position, the Examiner states on page 19 that "the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art". That said, Applicants address possible rationales in their remarks above and further address possible rationales in the remarks below.

Okamura fails to expressly disclose any "atmospheric pressure space" between the shell (10a, 10b) identified by the Examiner in Okamura and the electrodes (11, 13) and separating member (25) identified by the Examiner in Okamura. The Examiner does not rely on a secondary reference to teach such an "atmospheric pressure space". On page 18, the Examiner emphatically states that "if the Examiner believed a claimed feature were inherent he would specifically say as such. The Examiner's rejections are clear statements of what is and is not taught in the cited prior art". Accordingly, Applicants accept this admission by the Examiner, based upon his "clear statements", that the claimed feature is not inherent in Okamura. Therefore, according to the Examiner, there is no "teaching, suggestion, or motivation to do so ... found in the references themselves".

The only remaining possibilities are that the Examiner is attempting to rely on common knowledge or official notice of facts not in the record. If so, Applicants respectfully traverse the Examiner's position and requests that the Examiner provide documentary evidence to support his reliance on common knowledge or the taking of official notice of facts not in the record.

With regard to reliance common knowledge, it is never appropriate to rely solely on "common knowledge" in the art without evidentiary support in the record, as the principal evidence upon which a rejection is based. *See* MPEP 2144.03; In re Zurko, 258 F.3d 1379, 1385, 59 USPQ2d 1693, 1697 (Fed. Cir. 2001) ("[T]he Board cannot simply reach conclusions based on its own understanding or experience— or on its assessment of what would be basic knowledge or common sense. Rather, the Board must point to some concrete evidence in the record in support of these findings."). As the court held in Zurko, an assessment of basic knowledge and common sense that is not based on any evidence in the record lacks substantial

evidence support. In this instance, the Examiner has failed to identify any evidence in the record that supports his proposed modification to Okamura.

With regard to taking official notice of facts not in the record, the Examiner has failed to present documentary evidence supporting such an official notice of facts. Official notice unsupported by documentary evidence should only be taken by an examiner where the facts asserted are well-known and capable of instant and unquestionable demonstration. *See* MPEP 2144.03. The noticed fact (that Okamura can be modified to include the claimed atmospheric pressure space) is not well-known in the art and, therefore, is not capable of instant and unquestionable demonstration.

On page 19, the Examiner states that "in this case, the Examiner's statement that motivation for Okamura to establish an 'atmospheric pressure space' between 25/10a interface and the 25/10b interface based on the process for making Okamura's apparatus is for reducing product-by-process manufacturing costs". The Examiner's logic is unsupported. Notwithstanding that the reaction chamber (10) in Okamura is not a product of a process, the Examiner's position vitiates the legal concept of *prima facie* obviousness and examination guidelines for determining obviousness under 35 U.S.C. § 103. For example, the Examiner fails to explain how modifying Okamura to include such an "atmospheric pressure space" would actually reduce "product-by-process manufacturing costs". This is no more than a mere unsupported conclusion by the Examiner.

Applicants have adequately explained in their remarks above why a person having ordinary skill in the art would not reasonably conclude that an atmospheric pressure space could be present between the shell (10a, 10b) identified by the Examiner in Okamura and the electrodes (11, 13) and separating member (25) identified by the Examiner in Okamura.

Conclusion

Applicants have made a bona fide effort to respond to each and every requirement set forth in the Office Action. In view of the foregoing remarks, this application is submitted to be in complete condition for allowance. Accordingly, a timely notice of allowance to this effect is earnestly solicited. In the event that any issues remain outstanding, the Examiner is invited to contact the undersigned to expedite issuance of this application.

Applicants do not believe any fees are due in connection with filing this communication. However, if such petition is due or any fees are necessary, the Commissioner may consider this to be a request for such and is hereby authorized to charge any under-payment or fees associated with this communication, or to credit any over-payment, to Deposit Account No. 23-3000.

Respectfully submitted,

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